

# Canola variety x nitrogen x fertiliser placement trial – Merriwagga 2013

## Barry Haskins

Ag Grow Agronomy and Research

## Dr Peter Martin

Research Agronomist, Wagga Wagga

## Karl Moore

Technical Officer, Wagga Wagga

Nitrate N = 1.1 mg/kg

60-90 cm:

Ammonium N = 4.7 mg/kg

Nitrate N = 1.3 mg/kg

Total 96.6 kg/ha N (0-90cm)

## December 2013

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### Key Points

- Hyola 50 was the highest yielding variety in this trial.
- Applying nitrogen in this trial increased grain yield and profitability.
- Compared with pre-drilling nitrogen, the application of nitrogen rates of 30 kg/ha and above with the seed at sowing significantly decreased grain yield.
- The most profitable strategy was to grow Hyola 50 predrilled with 60 kg/ha of nitrogen.

### Trial aim

To measure the impact that various nitrogen rates and nitrogen placement strategies have on grain yield in 6 canola varieties.

### Trial details

Soil type: Red Sandy Loam

Soil test: 0 – 10 cm:

pH = 5.7, Al% = 1.5

Sulphur = 7 mg/kg;

Colwell P = 39 mg/kg

Nitrate N = 30.7mg/kg

Ammonium N = 1.5 mg/kg

10-30 cm:

Ammonium N = 4.5 mg/kg

Nitrate N = 1.6 mg/kg

30-60 cm:

Ammonium N = 3.7 mg/kg

Previous crop: Wheat

Seeder used: Morris Contour drill tines (12mm knife point and press wheel)

<5% Seed Bed Utilisation

Sowing date: 29<sup>th</sup> April

Herbicide: 1.0L/ha Roundup CT + 2L/ha Triflur X + 2L/ha Avadex Xtra

Starter fertiliser: 60 kg/ha Superfect  
(8.8% P, 11% S, 19.1% Ca)

Post-emergent herbicide: Nil

Fungicide: 400mL/ha Flutriafol on fertiliser

Insecticide: Nil

Harvest date: 7<sup>th</sup> November

### Treatments

#### Varieties

Hyola 50

Hyola 555TT

45Y86

43Y85

Victory V3002

ATR Stingray

#### Fertiliser

All had 60kg Superfect plus;

0, 15, 30, 60 and 120 kg/ha Nitrogen (in the form of urea)

#### Fertiliser placement

Either

- a) placed with the seed at sowing or

- b) pre-drilled 3cm below seed prior to sowing.

## Seasonal review

The soil profile was reasonably dry at sowing, with only about 40cm depth of moisture. This paddock was reasonably low in nitrogen following two good wheat crops (2.5t/ha in 2011 and 2.5t/ha in 2012).

The trial was sown into marginal moisture, and needed to be sown deeper than ideal for canola. As a result establishment was patchy. Weed control was exceptional..

Above average winter rainfall allowed crop growth to progress well. Conditions became very dry towards the end of August and early September, however rain arrived just in time to allow the crop to fill grain adequately. There were fewer winter frosts in 2013 than normal, so winter growth was strong and spring frosts did not limit grain yield.

Table 1: Monthly rainfall at Merriwagga 2013.

	Rainfall (mm)
Jan	0
Feb	60
Mar	45
Apr	0
May	15.5
Jun	57
Jul	49
Aug	24.5
Sep	33
Oct	7.5
Nov	-
Dec	-
Total	291.5
In-crop	186.5

## Trial results

### Yield

The average yield for this trial was 1317 kg/ha.

There was a significant effect of variety in this trial ( $p < 0.001$ ) with Hyola 50 being higher yielding than all other varieties (Figure 1).

There was an interaction between N rate and application method ( $p < 0.001$ ). As N rate increased so too did grain yield for the pre-drilled N treatment; however, where urea was applied with seed there was a positive grain yield response to the 15 kg/ha N rate but grain yield declined as N rate increased further (Figure 2). At 30 kg/ha N, grain yield reduced by 352 kg/ha when N was placed with the seed compared with being pre-drilled. At 60 kg/ha N and 120 kg/ha N, the yield reduction was 719 and 1323 kg/ha respectively

(Figure 2).

The most profitable nitrogen treatment in this trial was when 60kg nitrogen was pre drilled before sowing (table 2).

### Grain quality

Yet to be tested.

## Discussion

This trial highlights some important outcomes for maximising yield of canola in the region where this trial was grown.

The selection of the correct variety is extremely important. Hyola 50 had superior early vigour over all other varieties in this trial. This set it up to respond to the rain that fell during winter. Strong early vigour has been extremely important for profitable yields in marginal western environments. Hyola 50 has regularly been ranked at the top of the VSAP trials over several seasons across the region.

The other important factor in this trial was nitrogen application. The response in yield to added nitrogen was quite high and very profitable. This was to be expected given the low starting soil nitrogen status and the high N requirement of canola.

Separating nitrogen from the seed at sowing was important. This was particularly the case when applying rates of nitrogen of 30 kg/ha and above.. This effect was mirrored in the same trial in 2012.

## Acknowledgement

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GRDC-supported research project in south/central NSW to develop agronomic information for new varieties of wheat, lupins and winter oilseeds.

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (December 2013). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of NSW Department of Primary Industries or the user's independent adviser.

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Figure 1: Grain yield of varieties averaged across all nitrogen and fertiliser placement treatments in a trial at Merriwagga 2013.

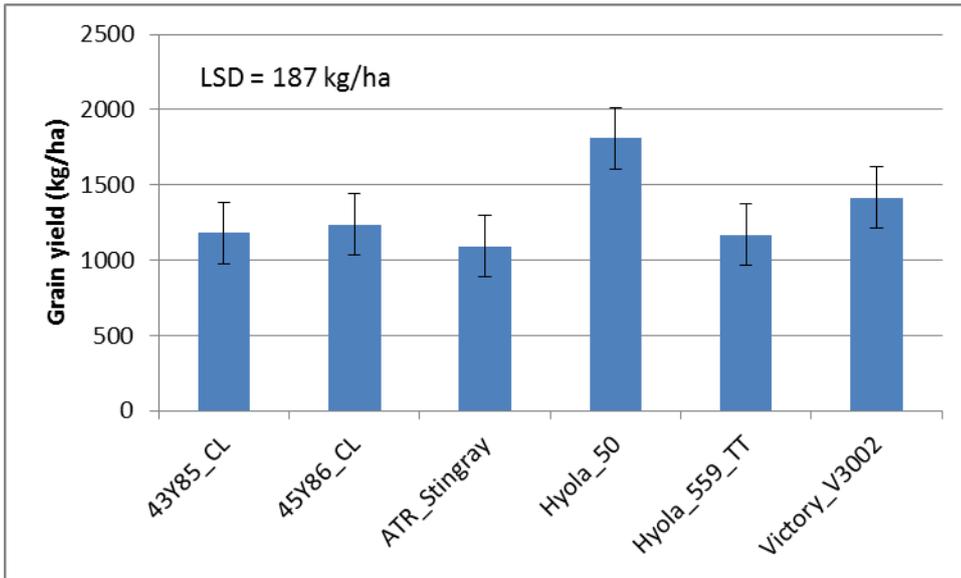


Figure 2: Grain yield of fertiliser placement and nitrogen rate interactions averaged across all varieties in a trial at Merriwagga 2013.

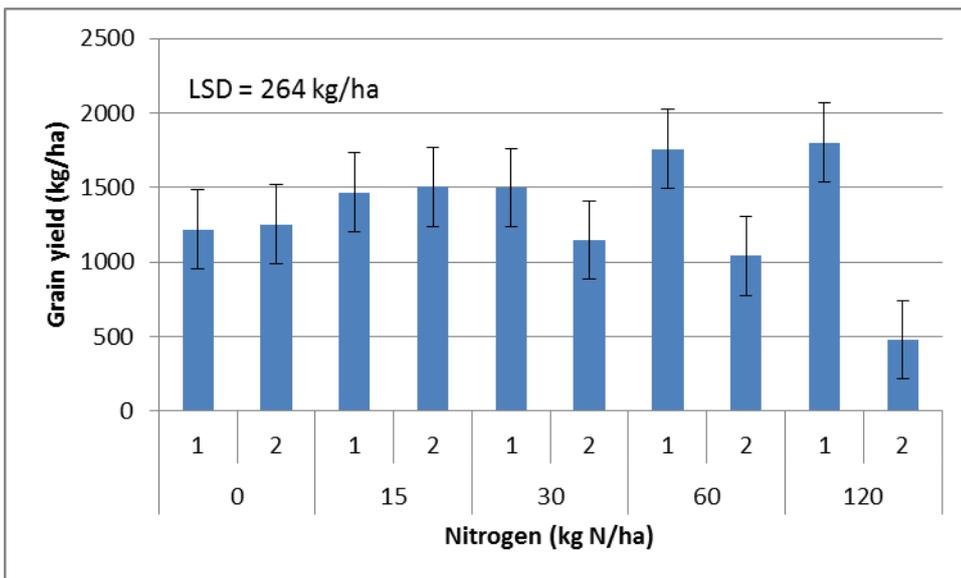


Table 2: Economic analysis of nitrogen treatments and fertiliser placement treatments in a trial at Merriwagga 2013.

	<i>0 N</i>		<i>15kg/ha N</i>		<i>30kg/ha N</i>		<i>60kg/ha N</i>		<i>120kg/ha N</i>	
	<i>Predrilled</i>	<i>With seed</i>								
<b>Yield (kg/ha)</b>	1218	1253	1467	1504	1500	1148	1760	1041	1802	479
<b>Income (\$/ha)*</b>	585	601	704	722	720	551	845	500	865	229
<b>Cost of nitrogen**</b>	0	0	\$17.80	\$17.80	\$35.60	\$35.60	\$71.28	\$71.28	\$142.56	\$142.56
<b>Cost of pre drilling</b>	\$0.00	\$0.00	\$30.00	\$0.00	\$30.00	\$0.00	\$30.00	\$0.00	\$30.00	\$0.00
	\$593.00									
<b>Benefit over nil N</b>	\$0.00		\$63.2	\$111.20	\$61.40	-\$77.60	\$150.72	-\$164.28	\$99.44	-\$506.56

\*Canola @ \$480/t on farm.

\*\*Urea at \$540/t on farm (ie \$1.17/kg N).